

LETTER REPORT - JANUARY 2009
SITE 1 – PHASE II SOIL VAPOR TESTING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

1.0 INTRODUCTION

This letter report has been prepared to present the initial results from the Phase II Soil Vapor Testing activities conducted from October 20th through October 30th, 2008 along the Town of Oyster Bay right-of-ways adjacent to the Naval Weapons Industrial Reserve Plant (NWIRP) in Bethpage, New York. Site 1 was identified as having been impacted by historic releases of chlorinated solvents and was remediated via an air sparging/soil vapor extraction (AS/SVE) system between 1998 and 2002. The treatment was based on protection of groundwater. Soil vapor testing conducted in January 2008 indicated elevated concentrations of VOCs existing along the eastern boundary of Site 1. The Phase II soil vapor testing was conducted to delineate the extent of contaminated soil vapor and determine if contaminated soil vapor has migrated offsite into the adjacent residential area.

The initial Phase II Soil Vapor Testing activities included the installation of 27 soil gas sampling points at the nine locations depicted on Figure 1. Soil gas samples were collected at approximate depths of 8 feet, 20 feet and 50 feet below ground surface (bgs) at each of the nine locations. Soil gas samples were analyzed for volatile organic compounds (VOCs) via EPA TO-15 method. This work was conducted in accordance with New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006).

2.0 SOIL GAS SAMPLING

At each of the nine locations, a continuous soil boring/core was advanced to approximately 50 feet bgs to evaluate the subsurface lithology. Three soil gas sampling points were then installed at each location using direct-push technology (DPT). The depths of the actual sampling points were modified in the field as necessary to avoid any silt or clay units encountered in the subsurface. The three soil gas sampling points at each location were placed approximately 2 to 3 feet away from each other.

SUMMA[®] canisters were utilized for collecting all soil gas samples. After sample collection, SUMMA[®] canisters were shipped to a fixed-based laboratory via overnight carrier (e.g., Federal Express) for analysis and the temporary soil gas monitoring points were abandoned by removing the drive rods, and filling the resulting hole with clean sand.

3.0 SOIL GAS SAMPLING RESULTS

Analytical results from the nine soil gas locations were validated in accordance to the EPA "Functional Guidelines for Organic Data Review", as amended for use within EPA Region II following the "USEPA Hazardous Waste Support Branch, Validating Air Samples, Volatile Organic Analysis of Ambient Air in Canister by Method TO-15," SOP #HW-31, Revision 4 (10/06). The final results for the two primary site-related compounds of concern, Tetrachloroethene (PCE) and Trichloroethene (TCE) are presented in Table 1 and also depicted on Figure 1. PCE and TCE were selected and presented since NYSDOH has developed indoor air screening values for these compounds and these two compounds represent the higher concentrations detected during the soil gas sampling.

No guidelines or screening values are established for vapors in the soil; therefore the PCE and TCE concentrations can only be compared to the proposed soil gas screening values outlined in the work plan and the concentrations observed on the Navy property. TCE concentrations showed approximately a two-fold decrease compared to the highest concentration observed on the Navy property ("Site 1 Soil Vapor Investigation", Tetra Tech NUS, April 2008). PCE and TCE concentrations are still approximately 50 times higher than the proposed soil gas screening values that are based on NYSDOH indoor air guidelines. Other target compounds exceeding the screening values presented in the work plan fall within the extent of the PCE and TCE contaminated area observed during the sampling and the highest concentrations of these other compounds were observed in BPS1-SG2002. These other compounds do not have established screening values by NYSDOH. However, future sampling will include these other compounds for laboratory analysis.

Elevated PCE and TCE concentrations were observed along 11th Street with the highest values of PCE found in BPS1-SG2001-20 at 5,000 ug/m³ and the highest value of TCE in BPS1-SG2002-20 at 89,000 ug/m³. However, based on the highest TCE concentration of 180,000 ug/m³ observed on the Navy property, approximately 70 feet west, this would be a 50% decrease in TCE concentrations. Substantial decreases in soil gas concentrations were also observed from the samples collected along 11th Street to the samples collected along 10th Street. Based on a comparison of concentrations from BPS1-SG2001 and BPS1-SG2002 to the concentrations from BPS1-SG2006 and BPS1-SG2007, the sample results showed an average of approximately 100 times lower concentrations of PCE and an average of approximately 390 times lower concentrations of TCE along 10th Street.

Soil gas sampling is used as a screening tool to determine whether contaminated soil vapor exists and to characterize the nature and extent of contamination. Based on NYSDOH, Guidance

for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006), soil vapor results alone cannot be relied upon to predict exposure concentrations in residential homes; therefore, additional testing will be conducted to evaluate indoor air quality by collecting sub-slab, indoor, and outdoor air samples and comparing to established NYSDOH screening values.

4.0 ADDITIONAL SAMPLING

Based on the soil gas sampling results from October 2008, two additional soil gas sampling locations were selected to further delineate the extents of soil gas in the residential neighborhood. These additional locations are depicted on Figure 1 (BPS1-SG2010 and BPS1-SG2011). It is anticipated that the additional soil gas sampling will be conducted in early January 2009. The analytical results from these additional soil gas samples will be presented in a future data summary report that will summarize the offsite soil vapor investigation.

5.0 FUTURE ACTIVITIES

Based on the need to evaluate the potential vapor intrusion into residential homes adjacent to Site 1, indoor air sampling will be conducted during the week of January 19, 2009. Indoor air sampling will initially target residential homes along 11th Street closest to the site. A Soil Vapor Extraction (SVE) pilot test is also being conducted in January 2009 to provide site specific information to aid in the design of an SVE system at Site 1.

TABLE 1
SOIL GAS SAMPLING ANALYTICAL RESULTS - OCTOBER 2008
NWIRP BETHPAGE, NEW YORK

Sample ID	BPS1-SG2001-08	BPS1-SG2001-20	BPS1-SG2001-49	BPS1-SG2002-08	BPS1-SG2002-20	BPS1-SG2002-44	BPS1-SG2003-08	BPS1-SG2003-20	BPS1-SG2003-49
Compound									
Tetrachloroethene (PCE)	4,000	5,000	720	420	740	48 J	19	14	8.9
Trichloroethene (TCE)	1,700	2,700	1,500	34,000	89,000	26,000	20	82	710

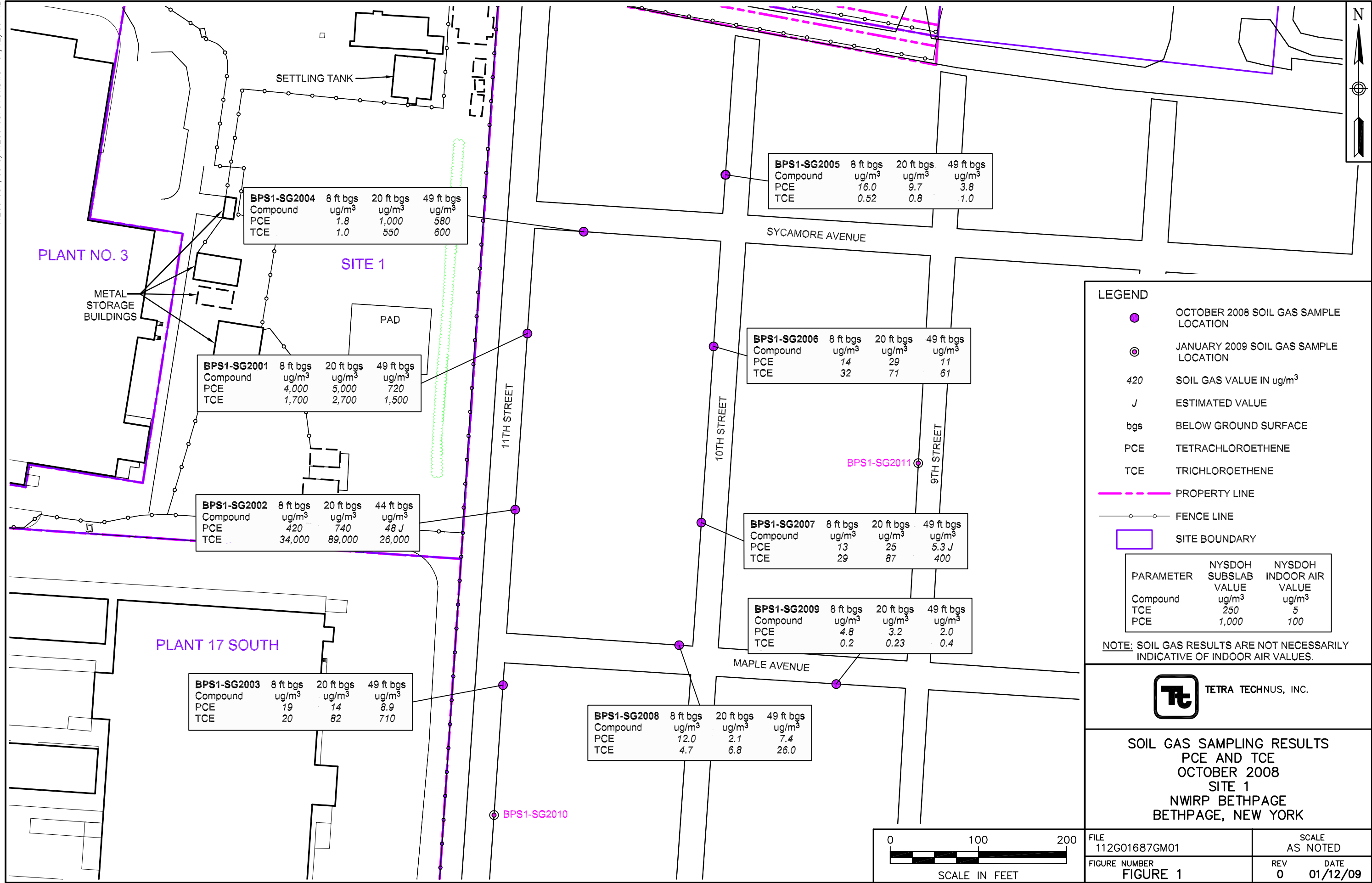
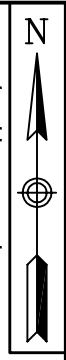
Sample ID	BPS1-SG2004-08	BPS1-SG2004-20	BPS1-SG2004-49	BPS1-SG2005-08	BPS1-SG2005-20	BPS1-SG2005-49	BPS1-SG2006-08	BPS1-SG2006-20	BPS1-SG2006-49
Compound									
Tetrachloroethene (PCE)	1.8	1,000	580	16	9.7	3.8	14	29	11
Trichloroethene (TCE)	1.0	550	600	0.52	0.8	1.0	32	71	61

Sample ID	BPS1-SG2007-08	BPS1-SG2007-20	BPS1-SG2007-49	BPS1-SG2008-08	BPS1-SG2008-20	BPS1-SG2008-49	BPS1-SG2009-08	BPS1-SG2009-25	BPS1-SG2009-48
Compound									
Tetrachloroethene (PCE)	13	25	5.3 J	12	2.1	7.4	4.8	3.2	2.0
Trichloroethene (TCE)	29	87	400	4.7	6.8	26.0	0.2	0.23	0.4

Values are shown in $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

J = Indicates reported value is estimated.

* Table presents only values for the two primary site-related compounds of concern Tetrachloroethene (PCE) and Trichloroethene (TCE). Respective depths below ground surface at each location are indicated in the sample ID (08 = 8 feet, 20 = 20 feet, etc.).



BPS1-SG2004

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	1.8	1,000	580
TCE	1.0	550	600

BPS1-SG2005

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	16.0	9.7	3.8
TCE	0.52	0.8	1.0

BPS1-SG2001

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	4,000	5,000	720
TCE	1,700	2,700	1,500

BPS1-SG2006

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	14	29	11
TCE	32	71	61

BPS1-SG2002

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	44 ft bgs ug/m ³
PCE	420	740	48 J
TCE	34,000	89,000	26,000

BPS1-SG2007

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	13	25	5.3 J
TCE	29	87	400

BPS1-SG2003

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	19	14	8.9
TCE	20	82	710

BPS1-SG2009

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	4.8	3.2	2.0
TCE	0.2	0.23	0.4

BPS1-SG2008

Compound	8 ft bgs ug/m ³	20 ft bgs ug/m ³	49 ft bgs ug/m ³
PCE	12.0	2.1	7.4
TCE	4.7	6.8	26.0

LEGEND

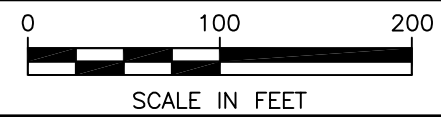
- OCTOBER 2008 SOIL GAS SAMPLE LOCATION
- ⊙ JANUARY 2009 SOIL GAS SAMPLE LOCATION
- 420 SOIL GAS VALUE IN ug/m³
- J ESTIMATED VALUE
- bgs BELOW GROUND SURFACE
- PCE TETRACHLOROETHENE
- TCE TRICHLOROETHENE
- PROPERTY LINE
- FENCE LINE
- SITE BOUNDARY

PARAMETER	NYSDOH SUBSLAB VALUE ug/m ³	NYSDOH INDOOR AIR VALUE ug/m ³
Compound		
TCE	250	5
PCE	1,000	100

NOTE: SOIL GAS RESULTS ARE NOT NECESSARILY INDICATIVE OF INDOOR AIR VALUES.



SOIL GAS SAMPLING RESULTS
PCE AND TCE
OCTOBER 2008
SITE 1
NWRP BETHPAGE
BETHPAGE, NEW YORK



FILE 112G01687GM01	SCALE AS NOTED
FIGURE NUMBER FIGURE 1	REV DATE 0 01/12/09